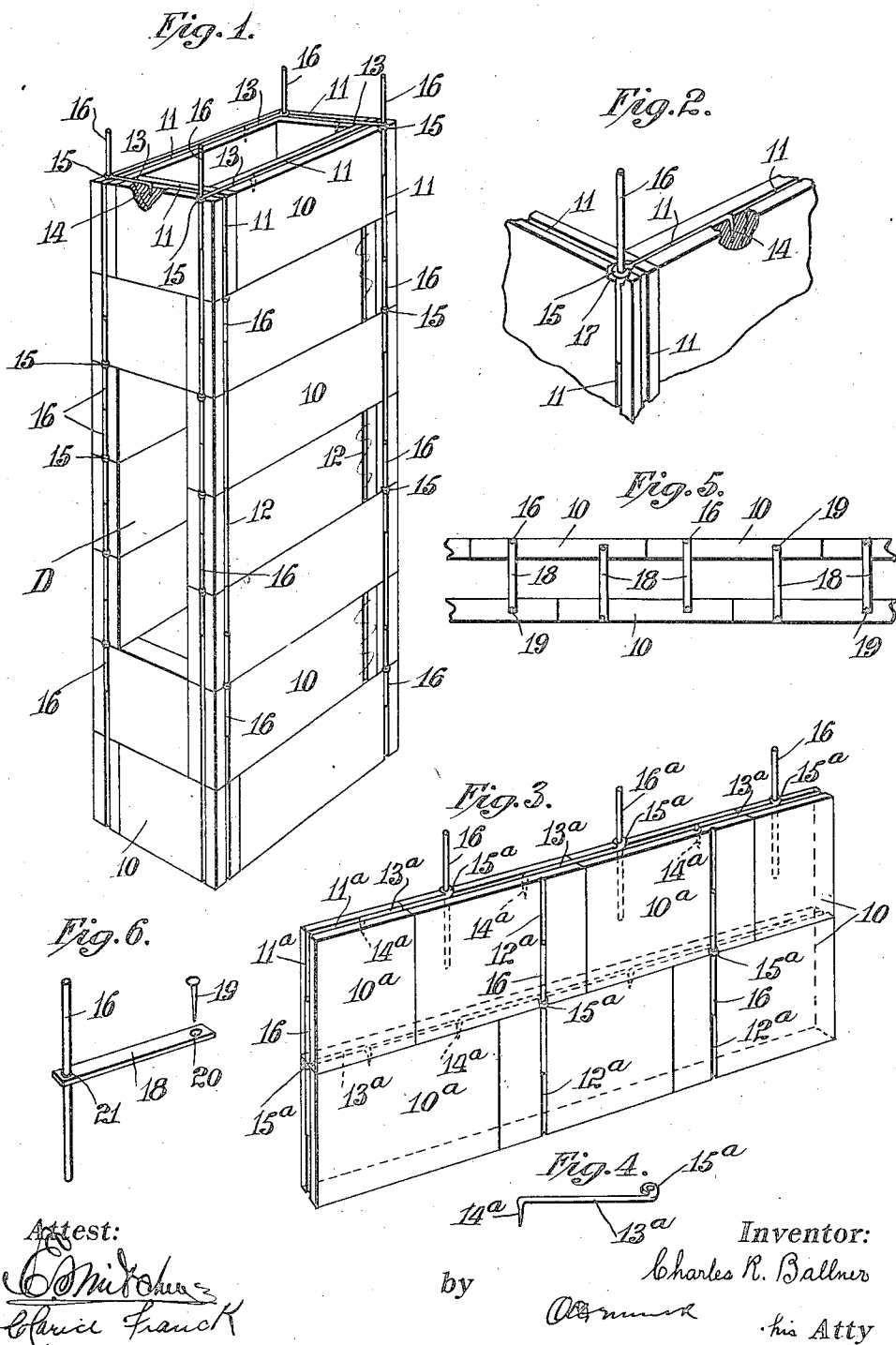


C. R. BALLNER.
BUILDING CONSTRUCTION.
APPLICATION FILED JULY 16, 1914.

1,222,174.

Patented Apr. 10, 1917.



UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES R. BALLNER, a citizen of the United States of America, residing at Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Building Construction, of which the following is a specification.

My invention relates to improvements in building construction of the type in which individual components, such as fireproof blocks, are laid in courses to form a complete structure. The invention is especially, although not exclusively, applicable to the construction of partition walls, dumbwaiter shafts, and the like.

One object of the invention is to simplify existing construction means of this type, whereby a saving of time, labor and expense is effected. Another object is to strengthen or reinforce such structures at the points heretofore regarded as the weakest and most liable to damage. Other objects will be disclosed in the following specification.

The invention embodies what I believe to be a new principle in building construction, and also includes an improved form of building block, as well as means for uniting blocks, and courses of blocks, to each other.

To enable my invention to be clearly understood, I have illustrated several forms of application thereof in the accompanying drawing, wherein—

Figure 1 is a perspective view of a dumbwaiter shaft in course of construction;

Fig. 2 is a fragmentary corner view thereof, on a somewhat larger scale than that of Fig. 1;

Fig. 3 is a perspective view of a partition wall in course of construction;

Fig. 4 is an elevational view of the anchoring means used in connection with the wall of Fig. 3;

Fig. 5 is a plan view of a double or hollow wall made according to my invention; and

Fig. 6 is a detail elevational view of anchoring means used in the construction of Fig. 5.

I will first describe the form of invention disclosed in Figs. 1 and 2, and referring to the same by reference characters, 10 denotes the components or blocks which are laid in courses to form a structure of any desired shape and size. All the blocks 10, which are preferably of fireproof material, may be made in a mold of standard size.

Each block has three of its edges grooved, as at 11, one of the longer edges preferably remaining intact, and each block is also provided on one of its faces, with oppositely disposed grooves 12, which are equidistant from the ends of the block. These grooves are all substantially semi-circular in cross section, and are of a depth to snugly receive anchors hereinafter described.

Owing to the fact that all the blocks are grooved in the manner above described, they may be made of a standard size, and if a smaller block is required, either end of a standard block may be cut off and there will always be one face groove and two edge grooves accessible. Such smaller blocks are required for the end walls of dumbwaiter shafts, in parts of which the blocks are laid in bonded course, *i. e.* where they break joints.

The anchor above referred to is clearly shown in Figs. 1 and 2 and includes a substantially straight shank member 13, of round metal, a spike member 14, and a loop member 15. The shank 13 is of a diameter to snugly fit into one of the grooves 11 just flush with the upper faces of the walls of the groove. The spike 14 is driven into the block groove 11 at a point where the loop member 15 will register with a groove 11 or a groove 12. The loops 15 are designed to receive visible dowels 16, which are passed through these loops to fit into the vertical edge grooves 11 and certain of the face grooves 12.

Where the blocks 10 are set in bonded manner, (breaking joints) as in Fig. 1, the anchor 13 clenches or bridges each two adjacent blocks, because of its spike-end 14 being driven into one of the blocks and its loop-end 15, interlocked by the visible dowel 16, retaining or anchoring the other block firmly in its place.

Where the dowels are not set in bonded manner as is the case where door-openings "D" are built into a shaft, the anchor, at both edges of the blocks forming such door-opening, is placed somewhat more inwardly from the block-end so as to engage and firmly retain the dowels within the edge-grooves, and said anchor, placed at each end of the block acts as a brace or horizontal reinforcement of the shaft.

The visible metal dowels 16 are preferably made of round iron or steel and in length equal the width of a block but they can be

shorter or longer as may be required for various purposes and these visible dowels form the vertical reinforcement of the shaft.

The visible dowel is inserted downwardly into a vertical edge-groove or face-groove, until it has passed through the loop of an engaging anchor, and has thus bridged or passed beyond a joint of two adjacent blocks and until about one half of its length is below its engaging anchor and below the horizontal joint of two abutting blocks, which it dowels or bridges.

The dowel is kept from slipping downwardly by any suitable means, as by a small portion of mortar pressed about it into its groove bed at one or more places, such mortar being readily obtained by a mason pointing up the joints between the blocks and particularly at the intersection of the anchor and dowel, where the mortar joint is heavier by reason of the mason having to chip out a notch 17 in the block 10 in order to admit the loop-end of the anchor. The mortar, compressed by the weight of the abutting block, is more than ample for the purpose of retaining the dowels in place.

The visible dowel 16 placed at the corner formed by the blocks, strengthens a shaft where reinforcement is most needed and half of the dowel being placed into the edge-groove while the other half of said dowel is within the face-groove, the same result is obtained as if two dowels were employed for this purpose.

The visible dowel, placed into the edge-groove, around door openings, is a very important feature because of the shaft door being frequently opened and shut (by self-closing springs), the blocks are apt to become loosened unless they are thoroughly reinforced and anchored.

Where a shaft consists of only two or three sides of blocks (the other sides being of brick, etc.) the dowel can be inserted into the edge-grooves at both ends of the blocks and will thus thoroughly reinforce and firmly retain in place several courses of blocks, even if the same should not be bonded at either end thereof, and will form a continuous line of dowels at both ends of the blocks throughout all courses that are not bonded. This is a feature possible only with my invention and has been devised to meet this emergency, which frequently occurs and for which so far as I am aware there has been heretofore no other remedy except the placing of angle-iron braces at considerable cost and delay.

The visible dowel, by reason of its interlocking the anchor, has the same effect as a wall-anchor except that the dowel as well as the loop of the anchor remain visible until inspection of the work has been made and until the structure receives plastering.

Throughout all bonded courses of a shaft

as shown in Fig. 1 a dowel anchor will be found alternately at the right and at the left side of the corner point of the shaft and, by reason of every block being engaged by two dowels in two distinctly separate places, the same effect is attained as if the dowels were continuous from bottom to top of the shaft and at both sides of the corner bonds, as is the case where angle-iron is used to support shafts.

The wall or partition shown in Fig. 3 is constructed of the same type of blocks as the shaft except that the blocks 10^a need be grooved only at their top edge, but where large door, or window, openings are built into a partition, which may be subjected to unusual wear and tear, the blocks are grooved at their edges and visible dowels are run continuously therein as around door openings of a shaft structure.

Vertical face grooves 12^a are provided within the inner and outer surface of the blocks at like distances from the ends of the blocks.

The blocks are set in bonded courses and are secured together by means of anchors 13^a each provided with a sharp, spike-like point 14^a at one end and with a loop 15^a at its other end.

The anchors are placed so as to bridge the vertical joints T, between each and every two adjacent blocks, the spike-end of the anchor being driven into the block at the left, the loop-end being placed above the vertical face groove of the block at the right, the straight portion of the anchor, fitting snugly within its groove-bed and being retained therein by the flat edge of the abutting (upper) block forms a strong horizontal reinforcement. The loops of the anchors are so arranged that they alternately meet the vertical grooves 12^a at the inner surface of the blocks of one course and at the outer surface of the blocks of the next course set thereupon.

The visible dowels 16 are inserted in the same manner and with the same effect as in the dumbwaiter shaft of Fig. 1.

Each visible dowel joins or dowels two abutting blocks, its lower half engaging the upper part of the lower block, and its upper half engaging the lower part of the upper block. This being repeated alternately at both the inner and the outer surfaces of the blocks a steel dowel-net-work of self-supported, thoroughly interlocked and anchored reinforcements is obtained both vertically and horizontally.

When the anchor is driven into its snug groove-bed, each two adjacent blocks, thus joined or bridged by the anchor, become immediately alined and if set plumb, additional blocks, laid upon them, will be perfectly plumb. This will eliminate the constant use of implements to determine

whether the blocks are properly set up and will save considerable time and consequent expense.

The visible dowels, by reason of their interlocking the anchor-loops, firmly tie or anchor all adjacent blocks and also connect all of the parts of the reinforcement by firmly interlocking one with the other. Said dowels engage each block at both of its surfaces, one dowel at the top half and another dowel at the bottom half with precisely the same effect as if these dowels were continuous from bottom to the top of the partition.

The horizontal part 13^a of the anchor, snugly fitting within the groove 11^a can well be termed a horizontal dowel as it not only eliminates the possibility of the anchor loop shifting, as would be the case in a wide groove but one end of the anchor being driven into the block and the other end being interlocked by the vertical visible dowel 16 the straight, horizontal part of the anchor becomes a horizontal dowel, which bridges the vertical joints of the blocks. The anchor drops readily into its snug groove-bed and adjusts itself the moment its sharp end is driven into the block. The loop end of the anchor fits exactly upon the vertical face-groove 12 or 12^a of the block and is readily and easily interlocked by the dowel, unlike where two loops, one at each end of an anchor, have to be looked after and where, by reason of uneven mortar joints, either one of such loops would not fit and would have to be adjusted, in which case the slightest movement of one of the loops would dislodge the other loop and would eventually necessitate the anchor being taken out of its wide groove-bed, the distance between the vertical grooves to be carefully measured and the anchor thereafter adjusted accordingly.

A modified form of construction is shown in Fig. 5, wherein a double or hollow wall is shown. In this form of invention, the walls are bridged or interconnected by anchors such as shown in Fig. 6. The anchor comprises a preferably flat metal bar 18 having an orifice 20 at one end thereof to receive a spike 19 which secures one end of the bar 18 to one wall, and having an orifice 21 at its other end to receive a dowel 16 which passes through 21 and into a corresponding groove in the opposite wall. The anchors of either Figs. 1 and 2 or Fig. 4 may be used with the construction of Fig. 5, although I prefer the anchor of Fig. 6.

I claim:

1. A structure for shafts, walls and the like, embodying therein blocks each having grooved edges and a grooved face and means for uniting said blocks, said means comprising an anchor having a shank portion lying in one of the grooved edges, a spike portion entering said grooved edge, and a

loop portion registering with one of the grooves in the face of the block, and a separate dowel passing through each loop portion and lying in the groove in the face of the block, whereby one dowel is adapted to bridge and bond two adjacent blocks.

2. A structure for shafts, walls and the like, embodying therein blocks laid in courses, each of said blocks being rectangular in shape and having grooved edges and a grooved face, an anchor having a sharp end and a straight shank lying in the edge groove of one block and a loop at the other end of the anchor registering with the face groove in an adjacent block, and a separate dowel passing through each loop and having one half its length in the face groove of one block and the other half of its length in the corresponding face groove of an adjacent block.

3. A structure for shafts, walls and the like, embodying therein blocks laid in courses, each of said blocks having grooves in its edges and a groove in the face of the block near one end thereof, the face groove in one block being alined with the edge groove in an adjacent block, anchors between adjacent blocks, each anchor having a straight shank lying in an edge groove of one block and a loop registering with the alined grooves of two adjacent blocks, and a separate dowel passing through each loop and lying partly in the face groove of one of the two adjacent blocks, and partly in the edge groove of the other adjacent block.

4. A dumbwaiter shaft of substantially rectangular configuration, embodying a series of blocks laid in courses, each block having grooved edges and a groove in the face of the block near one end thereof, anchors uniting said blocks and courses to each other, certain of said anchors extending at right angles to each other and each thereof comprising a straight shank portion fitting snugly in the edge groove of one block and a loop portion registering with two alined grooves of adjacent blocks, said loop portions being adjacent the corners of the shaft and in position at right angles to each other, and separate dowels passing through said loops and bridging the joints of adjacent blocks.

5. A dumbwaiter shaft embodying therein a series of courses of blocks each of which has a grooved edge and grooves in one face thereof, said face grooves being adjacent the ends of the block, certain of said courses being bonded or breaking joints whereby the edge groove of one block will aline with a face groove of one adjacent block, anchors for said blocks, each of said anchors including a loop registering with said alined edge and face grooves, and a separate dowel passing through each loop and bridging the joint between adjacent blocks.

6. A dumbwaiter shaft embodying therein a section composed of blocks each having grooved edges and a grooved face and laid in a bonded course whereby the edge groove in one block will aline with the face groove in an adjacent block, another section composed of similar blocks laid in a straight course whereby the edge grooves of adjacent blocks will aline, an anchor between each pair of adjacent blocks, each anchor comprising a sharp end and a straight shank portion lying in a horizontal edge groove in one block and a loop member registering with alined vertical grooves in adjacent blocks, and a separate dowel passing through each loop and bridging the joint between adjacent blocks.

7. A dumbwaiter shaft embodying therein a section composed of blocks each having grooved edges and a grooved face and laid in bonded courses whereby the edge groove in one block will aline with the face groove

in an adjacent block, another section composed of similar blocks laid in straight courses whereby the edge grooves of adjacent blocks will aline, anchors between adjacent blocks of said first named section, said anchors extending at right angles to each other and each comprising a straight shank portion lying in one of the edge grooves and a loop portion between alined edge and face grooves, similar anchors between adjacent blocks in said second named section, said last named anchors extending parallel to each other whereby the loops thereof will aline, and a dowel passing through each loop and bonding adjacent blocks together.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES R. BALLNER.

Witnesses:

OTTO MUNK,
CLARICE FRANCK.